

REMARKS

I. INTRODUCTION

Claims 45, 46, 48, 50, 52, 53, 55, 59, and 68 have been amended. Thus, claims 45 - 55, 59, 65, 66 and 68 are pending in this application. Based on the above amendments and the following remarks, it is respectfully submitted that all of the presently pending claims are allowable. No new matter has been added.

II. THE DOUBLE PATENTING REJECTION SHOULD BE WITHDRAWN

Claims 45-47 stand rejected under the judicially created doctrine of obviousness-type double patenting over claims 1-24 of U.S. Patent No. 6,385,486 to John et al. A Terminal Disclaimer along with a Statement under 37 CFR 3.73(b) are filed herewith to address this rejection. Thus, it is respectfully submitted that the obviousness-type double patenting rejection has been overcome and should be withdrawn.

III. THE OBJECTION TO THE CLAIMS SHOULD BE WITHDRAWN

Claims 52 and 55 stand objected to as failing to provide antecedent basis for all of the claim elements. In view of the amendments to the claims, it is respectfully requested that this objection be withdrawn.

IV. THE REJECTIONS UNDER 35 U.S.C. § 102(b) SHOULD BE WITHDRAWN

Claims 52, 54, 55, and 65 stand rejected under 35 U.S.C. 102(b) as anticipated by U.S. Patent No. 6,001,065 to DeVito.

DeVito describes a control system for a video game and includes no showing or suggestion of a medical system as claimed. Specifically, amended independent claim 52 of the present invention recites “*a medical system for analyzing brain waves of a subject at a location remote from the subject, the system comprising . . . (f) an output device generating an output signal based on the brain wave signal for analysis by an operator to determine the existence of brain dysfunction.*” This medical system detects a subject’s brain waves, then amplifies, transmits, and broadcasts the brain waves to a remote receiver to allow persons remote from a subject to analyze the subject’s brain waves to determine whether the brain waves are indicative of brain dysfunction. The medical system may be used, for example, to analyze brain function of a remote subject to aid in determining appropriate medical care. This *analysis* system is distinct from the *control* system in DeVito.

Specifically, the control system described in DeVito detects a subject’s presence in a controlled space, detects the subject’s bio-signals, and controls a device (e.g., a video game or an interactive movie) in the controlled space based on the input. The system detects bio-signals, including brain waves (EEG signals) or muscle movements (EMG signals), of a subject present within a controlled space, and a controller controls a device having a predetermined association with the controlled space. The control system does not broadcast the bio-signals to “a location remote from the subject;” rather, it controls a device having a predetermined association with the controlled space in which the subject is present. Further, the control system does not “generat[e] an output signal based on the brain wave signal for analysis by an operator to determine the existence of brain dysfunction.” The control system attempts only to sense a subject’s emotional state and based on this input, to control a video game environment or an interactive movie.

Therefore, DeVito includes no showing or suggestion of a medical use for its system and clearly neither shows nor suggests “a medical system for analyzing brain waves of a subject at a location remote from the subject, the system comprising . . . (f) an output device generating an output signal based on the brain wave signal for analysis by an operator to determine the existence of brain dysfunction.” as recited in independent claim 52 of the present invention. Accordingly, it is respectfully submitted that claim 52 is not anticipated by DeVito and this

rejection should be withdrawn. It is respectfully submitted that claims 54, 55, and 65, which depend from claim 52, are also allowable.

The Examiner has also rejected dependent claim 54 on the grounds "that the headband is a 'patch.'" (05/04/05 Office Action, p. 3). It is respectfully submitted that, for the reasons stated above in regard to claim 52, dependent claim 54 is not anticipated by DeVito and this rejection should be withdrawn.

V. THE REJECTIONS UNDER 35 U.S.C. § 103(a) SHOULD BE WITHDRAWN

Claims 48-50, 59, and 68 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 4,454,886 to Lee in view of U.S. Patent No. 5,279,305 to Zimmerman et al. and DeVito. The Examiner stated, in support of the rejection, that Lee shows a device with an active electrode, a filter, and a tone generator producing an audio output. Because the device in Lee does not include a connection means or a headband EEG device, the Examiner stated that these elements are shown in Zimmerman et al. and DeVito, respectively. (05/04/05 Office Action, p. 3-4).

Amended independent claim 48 recites a medical system to analyze brain waves of a subject, comprising an EEG electrode associated with connection means removably connecting the electrode to a subject's head and "a radio transmitter situated on the connection means, the *radio transmitter generating a brain wave broadcast signal based on the detected analog brain waves*, the radio transmitter broadcasting the brain wave broadcast signal" in combination with "a receiver receiving and amplifying the brain wave broadcast signal" and "sound generator coupled to the receiver, the *sound generator converting the brain wave broadcast signal into sounds, corresponding to the analog brain waves.*"

Lee describes an apparatus comprising means to establish a brainwave signal, means "for *defining segments*" of the signal, and means for generating sound output that is made up of "*a plurality of replica signals in sequence, wherein each replica signal has a duration which is a fraction of the duration of a predetermined segment of the input signal, and wherein each replica signal has a waveform which is geometrically similar to the waveform of the predetermined*

segment." (Lee, col. 6-7, claim 9). This apparatus creates segments of a brainwave signal, replicates each segment at a higher frequency, and based on this segmented and replicated signal, generates sound output containing "a fundamental tone and harmonics." (Id., col. 3, line 1). Therefore, the apparatus in Lee does not transmit the detected brainwave signal but instead transmits a segmented and replicated version of that signal.

In contrast, the present invention generates "a brain wave broadcast signal based on the detected analog brain waves" in combination with a "sound generator converting the brain wave broadcast signal into sounds, corresponding to the analog brain waves." Thus, the present invention broadcasts the entire brainwave signal in real time, not just predetermined segments. Further, the present invention does not replicate segments of the detected brainwave signal at a higher frequency. This is a significant difference because the brainwave signal itself is broadcast, not a segmented and replicated version as in Lee.

It is respectfully submitted therefore that Lee fails to show or suggest a medical system to analyze brain waves of a subject, comprising a "radio transmitter generating a brain wave broadcast signal based on the detected analog brain waves," and a "sound generator converting the brain wave broadcast signal into sounds, corresponding to the analog brain waves." It is further submitted that neither Zimmerman et al. nor DeVito cures this defect.

Furthermore, it is respectfully submitted that none of the cited references either shows or describes a medical system comprising connection means removably connecting an electrode to a subject's head and "a radio transmitter *situated on the connection means*," as recited in claim 48.

For these reasons, it is respectfully submitted that claim 48 is not rendered unpatentable by Lee, Zimmerman et al., and DeVito, either taken alone or in combination. Because claims 49 and 50 depend from and, therefore, include all of the limitations of claim 48, it is respectfully submitted that these claims are also allowable.

Similarly, amended claim 59 recites "an output device producing an audible output signal based on the brain wave signal," and amended independent claim 68 recites "broadcasting a brain wave broadcast signal, generated based on the detected analog brain waves" and "generating sounds based on the brain wave signals using the hand-held receiver by demodulating the

amplified brain wave broadcast signals.” Thus, it is respectfully submitted that both of these claims are allowable for the same reasons stated above in regard to claim 48.

Claims 48-50, 59, and 68 also stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 3,837,331 to Ross in view of Zimmerman et al. and DeVito. The Examiner stated, in support of the rejection, that Ross also shows a device with an active electrode, a filter, and a tone generator producing an audio output. Because the device in Ross does not include a connection means or a headband EEG device, the Examiner stated that these elements are shown in Zimmerman et al. and DeVito, respectively. (05/04/05 Office Action, p. 4).

Amended independent claim 48 recites “a medical system to *analyze* brain waves of a subject” comprising an active EEG (electroencephalograph) electrode, connection means, an amplifier, a radio transmitter, a receiver, and sound generator.

Ross describes “a system for *controlling* the nervous system of a living organism by *altering the waveform pattern of a bioelectrical signal* generated in its nervous system,” comprising electrically responsive means, amplifying means, a bandpass filter, duration sensing means, detection means for undesirable characteristics, transducing means for outputting a sensory signal, and inhibiting means when undesirable characteristics are detected, “whereby said organism is *trained to alter said waveform pattern of said bioelectrical signal in a desired manner by concentrating mentally* so as to affect the state of said sensory signal in a preselected way.” (Ross, col. 10-11, claim 14). In addition, Ross describes “a system for *controlling* the nervous system of a living organism by *altering the waveform pattern of a bioelectrical signal* generated in its nervous system so as to increase the energy content in a preselected frequency band . . . whereby said organism is *trained to increase the energy of content in said frequency band of said bioelectrical signal by concentrating mentally* so as to change the state of said visual display in a preselected way.” (Ross, col. 12, claim 24).

In contrast, claim 48 of the present invention recites “a medical system to *analyze* brain waves of a subject.” This analysis system detects a subject’s brain waves, then amplifies, and broadcasts the brain waves to a remote receiver and output device. The medical system may be used, for example, to analyze brain function to aid in determining appropriate medical care,

especially in comatose or unconscious subjects. This *analysis* system is distinct from the *control* and *training* system in Ross.

Specifically, the system described in Ross seeks to train a subject to control its nervous system using sensory signal outputs based on the subject's bioelectrical signals. This control and training system requires the subject's active involvement and mental concentration, aspects that are absent from a comatose or unconscious subject requiring medical analysis. Such a subject is unable to concentrate mentally and thus control its nervous system.

As the system of Ross seeks to train a subject to control its nervous system through mental concentration, it is respectfully submitted that this system is not "a medical system to *analyze* brain waves of a subject" as recited in claim 48 of the present invention. It is further submitted that neither Zimmerman et al. nor DeVito cures this defect.

Further, there is no motivation to combine the cited references as there is no need to broadcast a brain wave signal in the control and training system of Ross. The purpose of the system is to train a subject to control its own nervous system. The subject's brain waves are detected, amplified, filtered, and fed back to the subject as a stimulus for training purposes. Therefore, there is no showing or suggestion of broadcasting a brain wave signal for medical analysis, as recited in claim 48 of the present invention.

For these reasons, it is respectfully submitted that claim 48 is not rendered unpatentable by Ross, Zimmerman et al., and DeVito, either taken alone or in combination. Because claims 49 and 50 depend from and, therefore, include all of the limitations of claim 48, it is respectfully submitted that these claims are also allowable.

Similarly, amended claim 59 depends from claim 52, and amended claim 52 recites "a medical system for analyzing brain waves of a subject at a location remote from the subject." As stated above, there is no motivation to combine the cited references as there is no need to broadcast a brain wave signal to a remote receiver "for analysis by an operator to determine the existence of brain dysfunction." The control system of Ross is used only for training purposes, not for medical analysis. In addition, amended independent claim 68 recites "a medical method to analyze brain waves of a subject, comprising . . . broadcasting a brain wave broadcast signal,

generated based on the detected analog brain waves.” Thus, it is respectfully submitted that both of these claims are allowable for the same reasons stated above in regard to claim 48.

Claim 51 stands rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 3,837,331 to Ross in view of Zimmerman et al. and DeVito as applied to claims 48-50, 59, and 68 above, further in view of U.S. Patent No. 5,241,967 to Yasushi et al.. The Examiner stated, in support of the rejection, that “Yasushi further teaches that a desired level for inducing a particular brain state is one of alpha, theta, delta and beta brain wave states. Hence, it would have been obvious to modify the above combination to filter at one of these bands, as they are well known bands used to produce the desired brain wave state.” (05/04/05 Office Action, p. 4-5).

Claim 51 recites a “group of frequency bands includ[ing] delta, theta, alpha and beta bands.” Claim 51 depends from amended claim 48 which recites “a medical system to analyze brain waves of a subject.” It is respectfully submitted that Yasushi et al. does not cure the defect in Ross described above in regard to claim 48. Therefore, it is respectfully submitted that claim 51 is not rendered unpatentable by Ross, Zimmerman et al., DeVito, and Yasushi et al., either taken alone or in combination.

Amended claim 53 stands rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 3,696,808 to Roy et al. in view of DeVito. The Examiner stated, in support of the rejection, that “Roy shows an EEG monitoring system that provides an output signal indicating that a brain injury is detected.” (05/04/05 Office Action, p. 5).

Claim 53 recites an “output device generat[ing] a warning when the analysis of the brain wave signal indicates brain dysfunction.” In contrast, Roy et al. describes “a neurological diagnostic aiding system . . . wherein the visual indication means comprises a *digital voltmeter and a pen recorder*.” (Roy et al., col. 14, claim 19).

As the neurological diagnostic aiding system of Roy et al. specifically contemplates a digital voltmeter or a pen recorder, this system does not contemplate any type of “warning” (e.g., audio or visual signals) as recited in claim 53 of the present invention. Accordingly, it is

respectfully submitted that claim 53 is not anticipated by Roy et al. and this rejection should be withdrawn. It is further submitted that DeVito does not cure this defect. In addition, because claim 53 depends from amended claim 52, it is submitted that claim 53 is also allowable for the same reasons stated above in regard to independent claim 52.

Claim 66 stands rejected under 35 U.S.C. § 103(a) as unpatentable over DeVito. The Examiner stated, in support of the rejection, that "applicant has not stated that the specific number of electrodes and amplifiers is for a specific purpose or that they solve a stated problem. As such, it appears that the exact number of electrodes and amplifiers would have been a mere matter of design choice for one skilled in the art." (05/04/05 Office Action, p. 5).

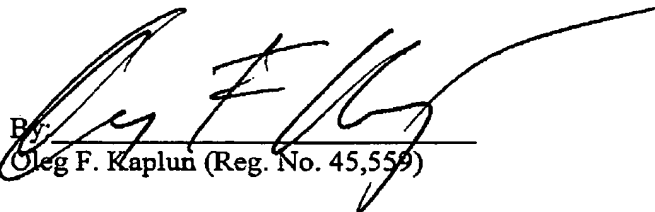
Because claim 66 depends from amended claim 52, it is respectfully submitted that claim 66 is allowable for the same reasons stated above in regard to independent claim 52.

CONCLUSION

It is therefore respectfully submitted that all of the pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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